

What is claimed is:

1. A retracting mechanism of a retractable lens,
comprising:

an external barrel movable in an optical axis
5 direction;

an adjustment ring positioned in said external
barrel and configured to be guided linearly in the optical
axis direction without rotating;

a stopper configured to set a rear movement limit
10 of said adjustment ring with respect to said external
barrel;

a lens frame configured to hold a lens group, said
lens frame configured to be screwed into said adjustment
ring;

15 a fixing ring fixed to said external barrel and
configured to prevent said adjustment ring coming off said
external barrel; and

at least one spring positioned between said fixing
ring and said adjustment ring and configured to bias said
20 adjustment ring toward the rear movement limit of said
adjustment ring with respect to said external barrel.

2. The retracting mechanism according to claim
1, wherein said adjustment ring is positioned in front
of the rear movement limit of the adjustment ring, with
25 respect to said external barrel, when said retractable

lens is in a retracted state.

3. The retracting mechanism according to claim 2, further comprising a movement limiter configured to come into contact with at least one of said fixing ring and said lens frame and prevent said fixing ring and said lens frame from further moving rearward, such that said fixing ring and said lens frame move forward relative to said external barrel when said external barrel moves rearward during a retracting operation of said retractable lens.

4. The retracting mechanism according to claim 3, wherein said lens frame comprises a rearward protrusion which projects rearward so that a rear end of said rearward protrusion is positioned behind a rearmost point on a rear surface of said lens group in said optical axis direction, said rear end of said rearward protrusion configured to come into contact with said movement limiter when said external barrel moves rearward during said retracting operation of said retractable lens.

5. The retractable mechanism according to claim 1, wherein said movement limiter comprises a shutter unit.

6. The retracting mechanism according to claim 1, wherein said adjustment ring comprises at least one guide projection, and

wherein said external barrel comprises at least one

guide groove into which said guide projection of said adjustment ring is configured to be engaged and guide said guide projection linearly in said optical axis direction.

7. The retracting mechanism according to claim
5 6, wherein said spring comprises at least one compression coil spring,

wherein one end of said compression coil spring is in contact with said guide projection, and

wherein the other end of said compression coil
10 spring is in contact with at least one spring receiving portion on said fixing ring in front of said guide projection.

8. The retracting mechanism according to claim
1, wherein said stopper comprises at least one engaging
15 projection on said adjustment ring, said engaging projection configured to be positioned in front of said fixing ring and come into contact with a front end surface of said fixing ring.

9. The retracting mechanism according to claim
20 8, wherein said engaging projection comprises a plurality of engaging projections on an outer peripheral surface of said adjustment ring at different circumferential positions proximate a front end of said adjustment ring.

10. The retracting mechanism according to claim
25 9, wherein said fixing ring comprises a plurality of

recesses configured to allow said plurality of engaging projections to be engaged in said plurality of recesses in said optical axis direction, respectively, when said fixing ring is positioned in a predetermined rotational position relative to said adjustment ring, and

wherein relative movement between said fixing ring and said adjustment ring causes rear end surfaces of said plurality of engaging projections and front end surfaces of said fixing ring to come into pressing into contact with each other by a spring force of said spring after said plurality of engaging projections are engaged in said plurality of recesses, respectively.

11. The retracting mechanism according to claim 10, wherein said plurality of recesses are at regular intervals in a circumferential direction of said adjustment ring, and

wherein said plurality engaging projections are at regular intervals in a circumferential direction of said adjustment ring.

12. The retracting mechanism according to claim 11, further comprising a retractable lens group positioned along the optical axis on which said lens group is positioned, in an operating state of the retractable lens,

wherein at least said lens group and said

retractable lens group are independently movable along the optical axis direction, and

wherein said retractable lens group is configured to retract to a position outside the optical axis.

5 13. The retracting mechanism according to claim 12, further comprising a rear lens group positioned behind said retractable lens group in the operating state of the retractable lens,

wherein said lens group, said retractable lens group
10 and said rear lens group are positioned along the optical axis in the operating state of the retractable lens, and

wherein said retractable lens group is configured to retract to said position outside the optical axis while said retractable lens retracts toward a rear of the
15 optical axis direction, to a position radially outside of said rear lens group, when the retractable lens moves from said operating state to a retracted state.

14. The retractable mechanism according to claim 13, wherein said lens group and said retractable lens
20 group are configured to move along the optical axis while changing space therebetween to perform a focal-length varying operation in said operating state of said retractable lens, and

wherein said rear lens group is configured to move
25 along the optical axis to perform a focusing operation

in the operating state of the retractable lens.

15. A retracting mechanism of a retractable lens, comprising:

an external barrel movable in an optical axis
5 direction;

an adjustment ring positioned in said external barrel and configured to be guided linearly in said optical axis direction without rotating;

a lens frame configured to hold a lens group, said
10 lens frame configured to be screwed into said adjustment ring;

a fixing ring fixed to said external barrel and configured to prevent said adjustment ring and coming off said external barrel;

15 at least one spring positioned between said fixing ring and said adjustment ring and configured to bias said adjustment ring rearward with respect to said external barrel; and

at least one engaging projection on said adjustment
20 ring, said at least one engaging projection configured to engage said fixing ring, and further configured to set a rear movement limit of said adjustment ring with respect to said external barrel, against a biasing force of said at least one spring.